

OBSERVATIONS ON ADULT BEHAVIOR OF THE
LYCID BEETLE *Calopteron terminale*
(COLEOPTERA: LYCIDAE)¹

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ABSTRACT: Observations were made on the mating, feeding and ovipositional behavior of *Calopteron terminale*. Individuals of this species were observed to repeatedly raise and lower their elytra while walking. A male was also detected with its mandibles inserted through an abdominal intersegmental membrane of a female upon whose body fluid it was presumably feeding. The possible significance of these behavioral traits is discussed.

DESCRIPTORS: Coleoptera, Lycidae, *Calopteron terminale* (Say), elytral movement, mating behavior, feeding habits, oviposition.

Knowledge about the biologies of beetles of the lycid genus *Calopteron* is primarily limited to occasional mention in the literature of their mimetic roles (Jones 1932, Linsley *et al.* 1961, Emmel 1965). Recent observations on *Calopteron terminale* (Say) made at Salmon, Anderson Co., Texas provide hitherto unpublished information on some rather unusual aspects of adult behavior of this species. These notes, although fragmentary, are presented now because involvement in other entomological studies precludes further investigation of this lycid in the near future.

C. terminale is widely distributed in the eastern half of the United States and Canada, having been recorded from Maine to Colorado and southward to Texas (Green 1952). The only significant biological information available for the species was presented in a paper by Young and Fischer (1972), wherein the pupa was described and illustrated and larval and pupal habits briefly discussed.

My first observation on adults of *C. terminale* took place on July 12, 1975 when an individual was seen walking about on hickory leaves opening and closing the elytra in a fairly regular manner. As no obvious attempt was being made to fly, this uncharacteristic behavior for beetles attracted my attention. This individual, a female, was captured and taken to the laboratory where the habit of opening and closing the elytra continued. Such

¹Accepted for publication: February 9, 1976

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elytral movement occurred only when the beetle was walking. The elytra were frequently elevated ca. 45° , while occasionally they were raised to the apparent maximum extent, projecting nearly vertically above the body. In captivity, the elytra were sometimes opened and closed rapidly but usually this occurred in a slow and fairly regular manner. A male observed later also exhibited similar movement of the elytra but the opening-closing sequence took place less frequently and more irregularly than in the female. To my knowledge this habit has not been described for any species of *Calopteron*. Also, it has not been reported in the related genus *Lycus* which has been studied relatively extensively (Linsley *et al.* 1961, Eisner and Kafatos 1962, Selander *et al.* 1963).

Due to the lack of sufficient study, any attempt to explain the significance of the elytral opening-closing sequence in *C. terminale* at this time must be considered highly speculative. However, it seems likely that elytral movement in this species may function in one or more of the following ways: (1) aids in dispersal of a sex attractant or aggregation pheromone; (2) serves as a visual cue in location of mates; and/or (3) in some way enhances the aposematic coloration in protection of these beetles from predators.

The opportunity to make limited observations on the copulatory habits of *C. terminale* came about when a pair of individuals *in copula* was collected at the Salmon locality July 19. The somewhat smaller male was mounted dorsally on the abdomen of the female with its mouthparts closely applied to the region of the metathorax and first abdominal tergum. The front and middle legs of the male grasped the side of the abdomen of the female while the hind legs were held outward. Antennae of the male projected vertically between the elevated elytra of the female. The anterior portion of the body of the male was nearly completely covered by the metathoracic wings of the female. The apex of the male's abdomen was bent ventrally and coupling with the female was effected from a ventroposterior position. Copulation was observed to be quite prolonged, lasting for a period of several hours after collection. While the specimens were thus coupled it was possible to handle them extensively without interrupting copulation.

Specimens of both sexes held individually in petri dishes

remained quiet for long periods of time and then became active for brief periods during which they crawled about and performed the elytral opening-closing sequence. When the two sexes were placed together the male would usually crawl upon the back of the female and attempt to burrow beneath her wings. In one case a male being observed under magnification mounted a female and inserted its angulate, sharply pointed mandibles into the intersegmental membrane between the metathorax and first abdominal segment where it presumably fed upon the body fluid of the female. The two individuals were not copulating at this time and no apparent attempt was being made to do so. Upon removal of the mandibles from the intersegmental membrane a small drop of yellowish body fluid welled up from the punctures but the bleeding stopped quickly. The intersegmental membranes on the anterodorsal portion of the abdomen are wide and when the female is receptive these membranes are exposed by spreading apart the tergites. An observation made by John A. Chemsak on *Calopteron* sp. (near *reticulatum* Fabr.) in the State of Chiapas, Mexico and cited by Linsley *et al.* (1961) is of considerable interest and has a bearing on the information presented here. Chemsak recorded that two males were seen feeding on droplets of a light colored fluid secreted from the thorax of the female. No openings of glands or any evidence of secretion of a fluid was seen in the few females of *C. terminale* examined. Based on the limited information presented here, injury in the form of puncturing of the integument may be required to release drops of fluid on which the males feed. Injury of females in the laboratory by puncturing the integument with a pin did not prove to be noticeably detrimental as bleeding, although momentarily profuse, ceased quickly. Linsley *et al.* (1961) observed the same reaction to artificially induced punctures in species of *Lycus*. In the present study females were never observed attempting to feed upon the body fluid of either males or other females, although several opportunities existed for them to do so. In view of the foregoing account it is of interest to note that a photograph of *Lycus fernandesi* Dugés included in the paper by Linsley *et al.* (1961) shows a male with its head beneath the elytra of a female. Perhaps a habit similar to that described above for *C. terminale* is practiced by this species of *Lycus*. The extent to which males of *C. terminale* normally feed upon the

body fluid of females remains to be determined by additional observation of this species.

Adults of *C. terminale* observed in the laboratory readily took water but did not feed on several live larvae of a small weevil, *Cossonus* sp., which were placed in the dishes. Other live food was not offered so the question concerning feeding habits of these beetles also remains unanswered. On the basis of characteristics of the mandibles, Young and Fischer (1972) suggested that the adults may be predaceous. The mandibles are certainly not adapted for mastication of solid food as the latter authors pointed out, but due to the slow movement and lack of aggressiveness of these beetles it is also doubtful that they are able to subsist entirely as predators.

Since nothing is known about the eggs or ovipositional behavior of this species results of the following observations are presented. One female kept in the laboratory for 2 weeks, deposited about 40 eggs in a single mass immediately before dying. The eggs of this species are broadly oval, ivory-colored with a finely granulate chorion and measure ca. 0.62 x 0.79 mm. Another female deposited eggs in strings composed of several eggs each. Since the larvae of *C. terminale* live in decaying logs (Young and Fischer 1972), small pieces of rotten wood were placed in the petri dishes as potential oviposition sites; however, the females avoided these and deposited their eggs instead on paper toweling in the bottoms of the dishes.

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